

Protocol Models and Frameworks

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Communications Protocols - 1976/77 and the ISO

- No Master Plan
- No Overall Structure
- No Agreements on Application Protocols
 - e.g. how do you do a file transfer ?
- Proprietary Protocols
- Proprietary Architectures
- Largely Anarchy

The New ISO Committees

- 1977 - ISO establishes a sub-committee of technical committee 97
- was “Open Systems Architecture”
- later “Open Systems Interconnection” OSI
- Now all work jointly with IEC and handled by Joint Technical Committee 1 (ISO/IEC JTC1)

Subcommittees of TC97

- SC6 - “telecommunications and information exchange between systems”
- SC21 “information retrieval, transfer and management for OSI
- SC18 “text and office systems and message handling protocols”
- SC20 “encipherment and its application”

Working Groups of SC21

- WG1 - “OSI architecture, conceptual schema, formal descriptions”
- WG2 - “graphics” (not OSI)
- WG3 - “databases” (not OSI)
- WG4 - “OSI management”
- WG5 “specific application services”
- WG6 “session and application layers and common application services”

Meanwhile at the CCITT

- SG VII - “data communications networks”
 - facilities (reverse charging, call redirect,...)
 - interfaces (X.25,X.21,...)
 - internetworking, maintenance, message handling,...
- SG VIII - “telematic services”
- SG XVIII - “digital networks”
- Questions
 - SG VII - Question 42 “OSI Reference Model”

Working Together

- CCITT was a Liaison member of ISO
- There were delegates in common ISO/CCITT
- Agree “identical wording of documents”
- ISO/CCITT start holding meetings
 - at the same time
 - with the same people
 - in the same room !
- Documents would only have procedural differences due to the rules of the organizations

OSI Reference Model - IS 7498

- Provides a *Basic Framework*
- “Divide and Conquer” principle
- Layering - reduces complexity
- each layer handles one (group of) problem(s)
- “break a complex and large problem into a sequence of smaller, simpler problems”

The Ten OSI Principles

1. overall structure simple
2. choose boundaries at places that minimize interaction between adjacent layers
3. functions of a different nature or purpose into different layers
4. collect similar functions together
5. use all our past knowledge and experience

The Ten OSI Principles

6. choose layers so the implementation is contained so that it does not affect the functionality
7. think about special hardware / processors
8. data abstraction levels
9. internal functions protocol changes do not affect other layers (similar to 6)
10. only create interfaces to directly surrounding layers

OSI Reference Model

Layer Number	Title
7	Application
6	Presentation
5	Session
4	Transport
3	Network
2	Data Link
1	Physical

OSI Model Layers

Application	user interface to lower layers and provides application oriented facilities
Presentation	data formatting / code conversion
Session	co-ordination between processes
Transport	control of quality of service and provides transport of data between end systems
Network	sets up and maintains connections, provides routing and relaying via intermediate systems
Data Link	reliable data transfer between directly connected systems
Physical	passes bit stream to network, covers mechanical, electrical, radio, optical etc. issues

Layer Services

